

16. RECENT RECORDS ON THE DISTRIBUTION, SEASONALITY AND OCCURRENCE  
OF REDSPOT BUTTERFLY, *ZESIUS CHRYSOMALLUS* HÜBNER  
FROM THE LOWER WESTERN HIMALAYA

The Redspot butterfly *Zesius chrysomallus* Hübner (1819) (Lycaenidae: Theclinae: Zesiini) which is endemic to the Indian subcontinent and is part of the Indo-Australian zoogeographic region has a geographical distribution extending into the states of West Bengal (Bholaghat in Malda district), Jharkhand, Orissa (Ganjam and Sambalpur) and Peninsular India (Bombay (=Mumbai), N. Kanara (Karwar), Coorg, Bangalore, the Nilgiris and Travancore) (Fig. 1) where its status is not rare. It also occurs as a locally common species in Sri Lanka (De Niceville 1890; Betham 1891; Swinhoe 1910-11; Evans 1932; Wynter-Blyth 1957; D'Abrera 1986). The female is larger than the male and is totally unlike in appearance, it being bluish with three tails on the hind wings, while the male is a bright copper colour with only 2 hind wing tails (Betham 1891). A female of this species (wingspan 37 mm; dated: November 12, 1913) from Gonda District of Uttar Pradesh state (northern India), and a male (wingspan 34 mm; dated March 3, 1919) collected from Colombo, Sri Lanka are present in the 'Collection' of the Forest Research Institute, Dehradun. Besides, it has also been reported from the Tarai region of Nepal (Chitwan District) as a rare species in riverine forest and water habitats (Smith 1989 and 1997). It is known to prefer jungle country in areas with fairly heavy rainfall and neither sex visits flowers much, but both have been observed at moist patches. The females prefer flying near the wet ground while the male darts about amongst the leaves of trees (Betham 1891). The eggs are laid in the vicinity of red

tree ant nests. The ants tend both the larvae and pupae constantly; the pupation takes place inside the ant's nest. Its food plants recorded in literature so far are: *Terminalia paniculata*, *T. alata*, *Pterocarpus marsupium*, *Psidium guajava*, *Loranthus* spp. (Wynter-Blyth 1957) and *Xylia dolabriformis* (Sevastopulo 1973).

Recently, this butterfly was recorded from Dehradun valley (30° 00' N to 30° 35' N and 77° 40' E to 78° 15' E; Uttaranchal State). One female (wingspan: 38 mm) was collected from a moist patch on the ground in the New Forest campus (670 m) during April 1989 (Singh 1999).

Mackinon and De Niceville (1899) who studied the butterflies of Mussoorie and its neighbouring regions for 11 years (1887-1898) have not recorded this species in Dehradun district. As there were no previous records of this butterfly from the western Himalaya, it was decided that extensive surveys should be carried out in the Dehradun valley to learn more about the distribution, seasonality and relative occurrence of this butterfly in the lower west Himalayan tracts.

#### Present Survey

*Study area:* The Dehradun valley lies between the west Himalayan mountain ranges in the north and the Siwalik range running parallel to it in the south at a mean altitude of 485 m and covers an area of c. 1920 sq. km. In the west it is bordered by the river Yamuna and in the east by the river Ganga. The valley is also well watered by perennial streams. The mountain slopes on both sides (north and south) of the valley are covered with pure and mixed forests dominated by Sal *Shorea robusta* [tropical moist deciduous Sal forests (TMDSF) (Champion and Seth 1968)]. These forests cover 51-58% of Dehradun valley (Anon. 1995). However, the flat areas in the central part of the valley, which were once under Sal forest cover are today under different land use practices: irrigated and cultivated agricultural land (wheat, sugarcane, paddy, maize, pulses, peas, ginger, turmeric and yams); agroforestry plantations (mainly poplar, eucalyptus and sisham); tea gardens (with *Dalbergia sissoo* as shade trees); fruit orchards (mango, litchi, guava, plum, peach, pear, citrus fruits etc); urbanized areas (densely constructed buildings in the city); cantonments (spaced houses/big buildings having lawns, gardens and orchards) and scrubland.

The valley receives approximately 200 cm rainfall annually, mostly during the monsoons (June-September). The temperature fluctuates between -1°C to 43.9°C from winter to summer.



Fig. 1: Map depicting the geographical distribution of Redspot butterfly, *Zesius chrysomallus* Hübner in the Indian subcontinent and collection sites as mentioned in the text

*Study sites:* A total of 8 sites were selected for the study in the entire Dehradun valley. These included, 6 sites in the TMDSF which were located at Karvapani, Timli, Thano, Baarwala, Jhajra and Lacchiwala forest ranges, of the Dehradun forest Division (Karvapani and Timli lie on the northern side of Siwalik mountains, Thano and Baarwala touch the south facing mountain slopes of lower Himalayan ranges, Jhajra and Lacchiwala are in the flat areas in the central part of the valley). Each forest site covered a minimum of 4 sq. km. The two sites outside TMDSF were New Forest Campus and Hathibarkala estate, which lay in the cantonment areas (having gardens, big fields and lawns, fruit tree orchards, agriculture, plantations, tree avenues, buildings, etc) and covered the same area.

*Sampling:* Sampling was based on the methodology proposed by Blair and Launer (1997) Each site was sampled for butterflies during sunshine for 2 hours for two successive days, at each site. Each site was divided into 4 plots (2 ha each). Each site was sampled once in 2 months for 2 years (July 2000-August 2002). A total of 10 samplings for each site were obtained in 2 years. All the three strata (canopy, middle story and ground) were sampled for butterflies with the help of binoculars and butterfly nets. The number of each butterfly species was recorded by walking on a jungle trail in a linear transect for half an hour in each plot. Voucher specimens were collected for authentic identification. Specimens were identified by comparing with the collection at Forest Research Institute, Dehradun.

*Relative occurrence:* The relative occurrence of individual butterfly species for the entire year (study period) was categorized into 5 different classes: Rare (1-8 counts); Not rare (9-40 counts); Fairly common (41-80 counts); Common (81-160 counts) and Very common (>160 counts). This was based on the presence of a species on a scale of 1-320 counts (4 plots x 8 sites x 10 sampling periods) [where a species can take a minimum score of 1 (an individual species recorded only once in a plot at a single site during the entire sampling period) and a maximum score of 320 (an individual species recorded every time in every plot at every site during the entire sampling period)].

*Distribution, seasonality and occurrence:* *Zesius chrysomallus* was collected and observed on only two occasions at only 2 sites, namely site-8 (Hathibarkala estate: 730 m, on March 24, 2001, one male; wingspan: 34 mm) and at site 4 (Baarwala: 700 m, on May 22, 2002, two males; wingspan

of one: 32 mm), during the sampling period. As this butterfly was spotted on only 2 occasions in the total samplings, it was categorized as a 'rare' species in the valley.

*Habits and Habitat:* A male was observed basking in the sunshine on a leaf of a small *Nyctanthes arbor-tristis* (Harsingar) tree, in the morning at Hathibarkala estate. At Baarwala, both the individuals were caught feeding on nectar from *Syzygium operculata* trees growing beside a stream in an open degraded Sal forest in the company of Large Oak Blue *Arhopala amantes* Hewitson (Lycaenidae) in the afternoon. The *S. operculata* at this site also harboured *Oecophylla smaragdina* – a species of red tree ant, and the epiphyte *Loranthus longiflorus* with which its larvae are associated.

The observations made herein refurnish recent evidence on the northwestern limit of the geographical distribution of this species, which now extends up to Dehradun valley in the lower western Himalaya rather than up to Nepal *tarai* in the lower Central Himalaya, as known previously. These observations also reveal that *Z. chrysomallus* is a rare species in Dehradun valley occurring between 650 and 800 m altitude with flight period during March to May. The availability of a large number of its food plants like *Psidium guajava* (cultivated), *Terminalia alata* and at least 2 species of Loranthus namely, *L. longiflorus* and *Taxillus vestitus*, in the Dehradun valley offer sufficient chance for this butterfly to breed and survive in the lower western Himalaya. *Z. chrysomallus* specimens will be deposited at the FRI collection after completion of this study.

#### ACKNOWLEDGEMENTS

The present study is part of a research project (FRI-145/FED-9) being carried out at Entomology Division, Forest Research Institute, Dehradun. I thank Dr. Mukhtar Ahmad (Head, Entomology Division) for providing the necessary facilities and to B.C. Pandey and Raj Kumar (Technical Assistants) for their help in carrying out fieldwork.

March 6, 2003

ARUN P. SINGH  
Entomology Division,  
Forest Research Institute  
P.O. New Forest,  
Dehradun 248 006, Uttaranchal, India.  
Email: singhap@icfre.org

#### REFERENCES

ANONYMOUS (1995): The State of Forest Report. Forest Survey of India, Kaulagarh Road, Dehradun. 98 pp.  
BLAIR, R.B. & A.E. LAUNER (1997): Butterfly diversity and human land

use: species assemblage along an urban gradient. *Biological Conservation* 80: 113-125.  
BETHAM, J.A. (1891): Butterflies of central provinces. *J. Bombay Nat.*

*Hist. Soc.* 6: 175-183.

CHAMPION, H.G. & S.K. SETH (1968): Forest Types of India. Government of India Publication, Delhi. 404 pp.

D'ABRERA, B. (1986): Butterflies of the Oriental Region. Part-III (Lycaenidae and Riodinidae), Hill House, Australia. 539 pp.

DE NICEVILLE, L. (1890): Butterflies of India, Burmah and Ceylon. Part III. Calcutta Central Press Co. Ltd. Calcutta, 503 pp., pl. 7.

EVANS, W.H. (1932): The Identification of Indian Butterflies. 2<sup>nd</sup> ed. Bombay Natural History Society, Bombay. 464 pp., pl 38.

MACKINON, P.W. & L. DE NICEVILLE (1899): List of butterflies of Mussoorie in the Western Himalayas and neighbouring region. *J. Bombay Nat. Hist. Soc.* 11: 205-221, 368-389, 585-605.

SEVASTOPULO, D.G. (1973): Food plant of Indian Rhopalacera. *J. Bombay*

*Nat. Hist. Soc.* 70: 156-183.

SINGH, A.P. (1999): New Forest, Dehradun, India: A unique man-made habitat for butterflies in the Lower Western Himalayas. *Indian Forester* 125(9): 913-922.

SMITH, C. (1989): Butterflies of Nepal (Central Himalayas). Craftsmen Press, Bangkok. 352 pp.

SMITH, C. (1997): Butterflies of Royal Chitwan National Park, Nepal (Field guide, illustrating all 247 recorded species). Tecpress Books, Bangkok, Thailand. 80 pp.

SWINHOE, C. (1910-11): Lepidoptera Indica. Part IX. Lovell Reeve Co. Ltd., London.

WYNTER-BLYTH, M.A. (1957): Butterflies of the Indian Region. Bombay Natural History Society, Bombay, 523 pp., pl. 72.

## 17. OCCURRENCE OF *GRAPHIUM DOSON* COMMON JAY BUTTERFLY, FAMILY PAPILIONIDAE, IN MUMBAI, MAHARASHTRA

The Family Papilionidae in Mumbai is represented by ten species of butterflies (Best 1951) of which three species belong to genus *Graphium*. Among these, the Tailed Jay *G. agamemnon* is the most common and found all over the city, in the suburbs and the outskirts of Sanjay Gandhi National Park. The remaining two species, Spot Swordtail *G. nomius* and Common Blue Bottle *G. sarpendon* are restricted to forest and green patches in and around the Sanjay Gandhi National Park. On December 8, 2002, while walking along the roadside at Goregaon – a suburb of Mumbai, at 1030 hrs, we observed two butterflies sucking liquid from a mud puddle. On a closer look they were identified as the Common Jay *Graphium doson*.

Wynter-Blyth (1957) reports the distribution of *G. doson* as Ceylon (=Sri Lanka), South India to Bengal and from eastwards of Kumaon to Assam and Burma (=Myanmar). Talbot (1939) has described three subspecies – *G. doson doson* (C & R Felder) from Sri Lanka, *G. doson eleius* (Fruhstorfer) from Southern India to Bengal and *G. doson axion* (C & R Felder) from Kumaon (N. India) to Myanmar.

The Common Jay has not been reported from Mumbai region by earlier workers, and this is the first record of its occurrence from Mumbai. One of us (ST) observed the breeding of this species during December 2002. She collected a larva feeding on leaves of Mast tree *Polyalthia longifolia*

at Jogeshwari, a suburb of Mumbai. The larva was reared *in situ* by feeding fresh leaves of *P. longifolia*. The larva pupated on December 4 and the butterfly that emerged on December 14, 2002 was identified as the Common Jay *G. doson*.

Bell (1912) has described the Common Jay as a sun-loving butterfly, sipping moisture on roads and in beds of nullahs in hot months and rains. According to him, it seems to be confined to hills and jungles from sea level upwards. Its occurrence along the busy city roads of Mumbai and breeding in this habitat is noteworthy.

March 17, 2003

NARESH CHATURVEDI<sup>1</sup>

SHEILA TANNA<sup>2</sup>

VARAD GIRI<sup>1,3</sup>

<sup>1</sup>Bombay Natural History Society  
Hornbill House, S.B. Singh Road,  
Mumbai 400 023, Maharashtra, India.

Email: bnhs@bom4.vsnl.net.in

<sup>3</sup>Email: varadgiri@bnhs.org

<sup>2</sup>503-A, Vertex Vikas,

M.V. Road, Opp Rly Stn.,

Andheri (E), Mumbai 400 069,

Maharashtra, India.

## REFERENCES

BELL, T.R. (1912): The Common Butterflies of Plains of India (including those met with in the hill stations of the Bombay Presidency). *J. Bombay Nat. Hist. Soc.* 21(11): 740-766.

BEST, A.E.G. (1951): The butterflies of Bombay and Salsette. *J. Bombay Nat. Hist. Soc.* 50: 331-339.

TALBOT, G. (1939): Fauna of British India including Ceylon & Burma, Butterflies Vol. I, Taylor & Francis Ltd., London.

WYNTER-BLYTH, M.A. (1957): Butterflies of the Indian region. Bombay Natural History Society, Bombay. xx + 523 pp, 27 coloured & 45 black-and-white plates.

## 18. CANNIBALISM OBSERVED IN THE MONKEY PUZZLE BUTTERFLY *RATHINDA AMOR* (LEPIDOPTERA: LYCAENIDAE)

The food plants of the Monkey Puzzle butterfly *Rathinda amor* belong to families Rubiaceae,

Dipterocarpaceae, Euphorbiaceae, Loranthaceae, Sapindaceae and Mylaceae (Bell 1919). The larvae are pinkish-red, a perfect